# Topic 3 – Practical 3

## *Boyle’s law*

### Safety

There are no safety issues concerning this experiment.

### Apparatus and materials

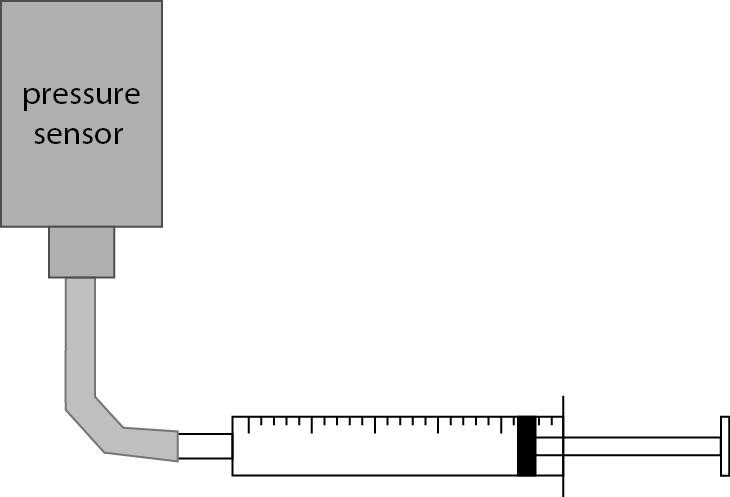
* syringe (100 cm3)
* sealing lubricant
* pressure sensor
* rubber tube

### Introduction

Boyle’s law is the relationship between the pressure and the volume of a gas for a given mass of gas kept at constant temperature. It states that the volume of the gas *V* is inversely proportional to its pressure *P* and can be expressed as:

or

It is equivalent to the ideal gas law *PV* = *nRT* (*n* = number of moles of gas, *R* = gas constant, *T* = temperature of gas) when *n* and *T* are constant.



### Procedure

1. To ensure that no air will leak, cover the piston seal of the syringe with a small amount of lubricant, as well as the connections of the rubber tube with the syringe and the pressure sensor.
2. Adjust the initial volume of the syringe to 50 cm3 and wait for a few minutes for the air in the syringe to reach equilibrium. Then measure the pressure of the air using the pressure sensor.
3. Increase the volume by 10 cm3 and repeat step **2**.
4. Repeat the process for five volumes in total. Record your measurements in an appropriate table.
5. Plot a graph of your data.

### Questions

1. What is the shape of the line that Boyle’s law would have in a graph of P vs V?
2. How could you graph your data so as to obtain a straight line?